

Fukushima nuclear power plant and your health

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- (5) Radiation and radioactive materials released from the nuclear power plant
- (6) Contamination of air, water, and food with radioactive materials.
- (7) Radiation and health.



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There are only two episodes in human history :

Hundreds of thousands of people exposed **biologically significant dose**
(= meaningful amount) of radiation

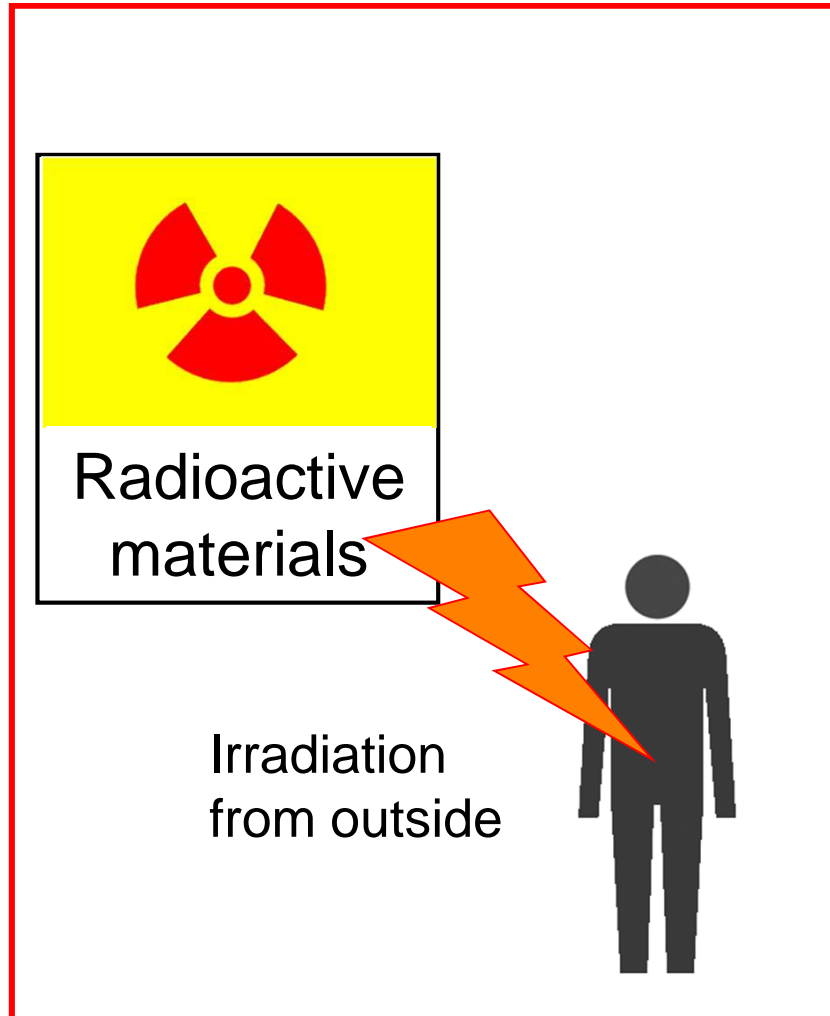
1. Hiroshima & Nagasaki, atomic bomb in 1945
2. Chernobyl, nuclear plant accident in 1986

To tell the conclusion first,

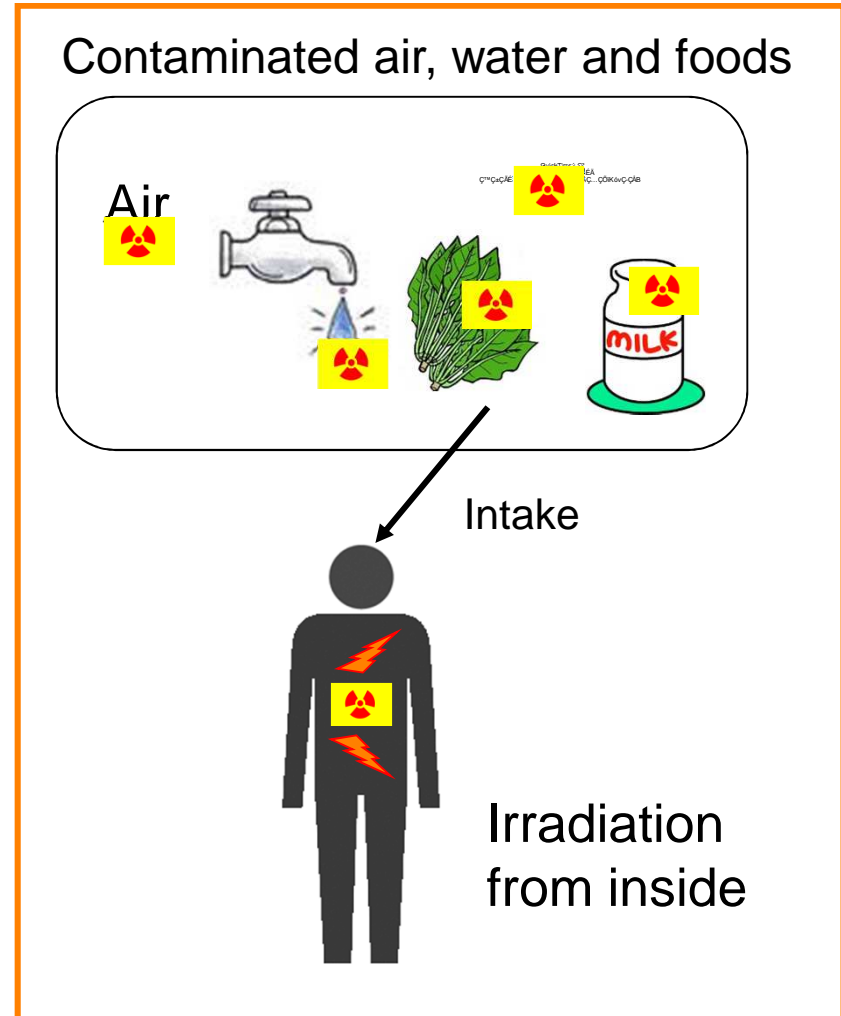
'Fukushima' *unlikely* becomes the third episode.

How people are exposed to radiation?

External exposure



Internal exposure



How radiation harms your health

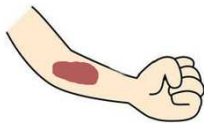
Discriminate these two clearly

Immediate damage within weeks

Very high dose (=amount)
by mainly external exposure



Hair loss

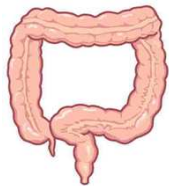


Burn

Serious damage



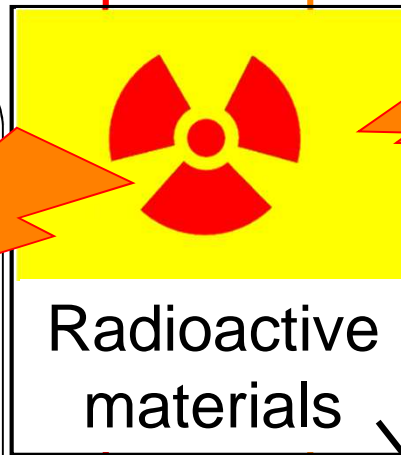
Brain



Intestine/Colon



Blood-producing system

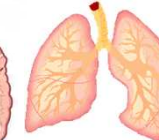


Radioactive materials

Cancer may develop years later

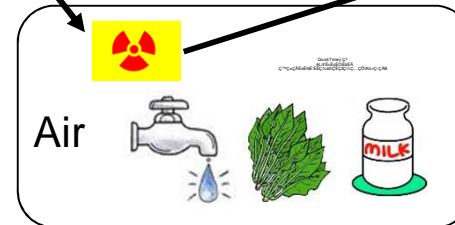
Relatively low dose
by external & internal exposure

Breast



Lung

Thyroid gland



Air



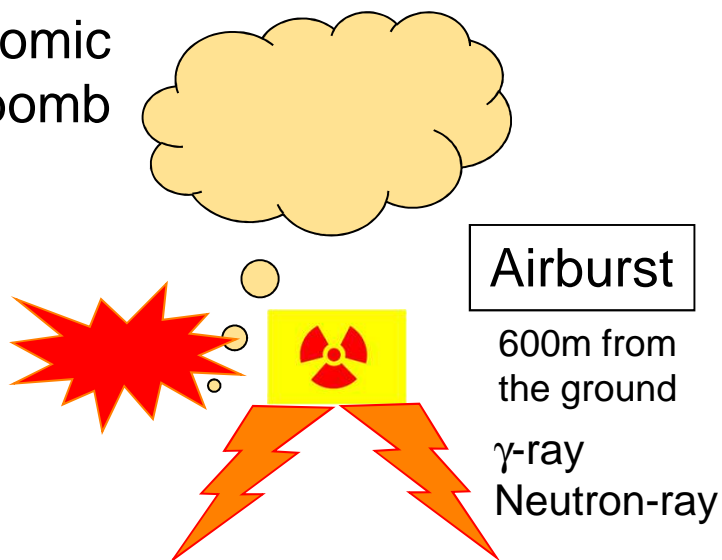
(It will *never* happen to you)

(It *might* concern you)

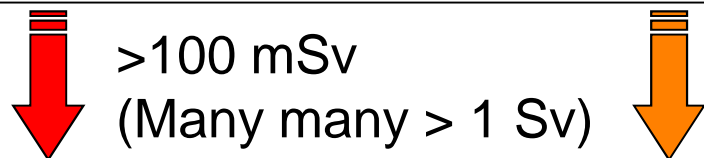
External exposure (Irradiation from outside)

Hiroshima & Nagasaki

Atomic bomb



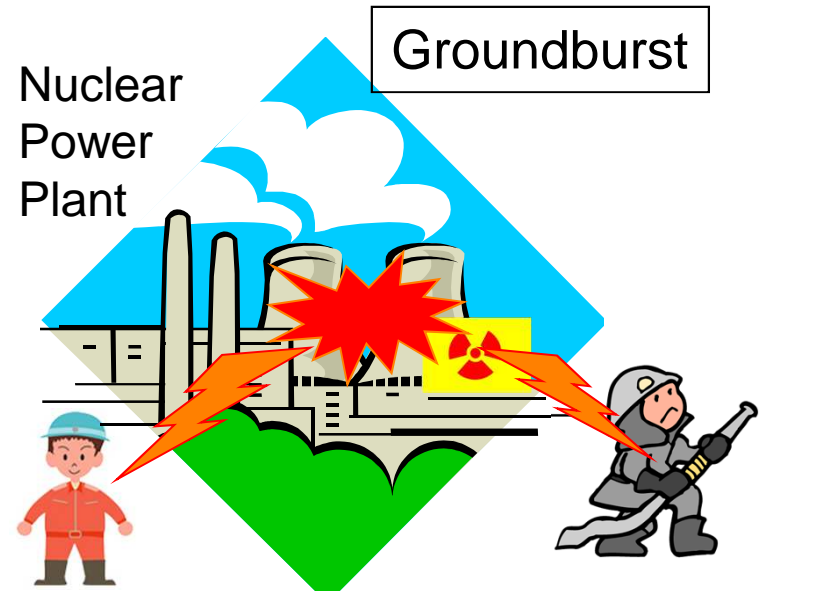
Hundreds of thousands of citizens



Died ~140,000
within 1 month

Leukemia ↑
Other cancers ↑

Chernobyl



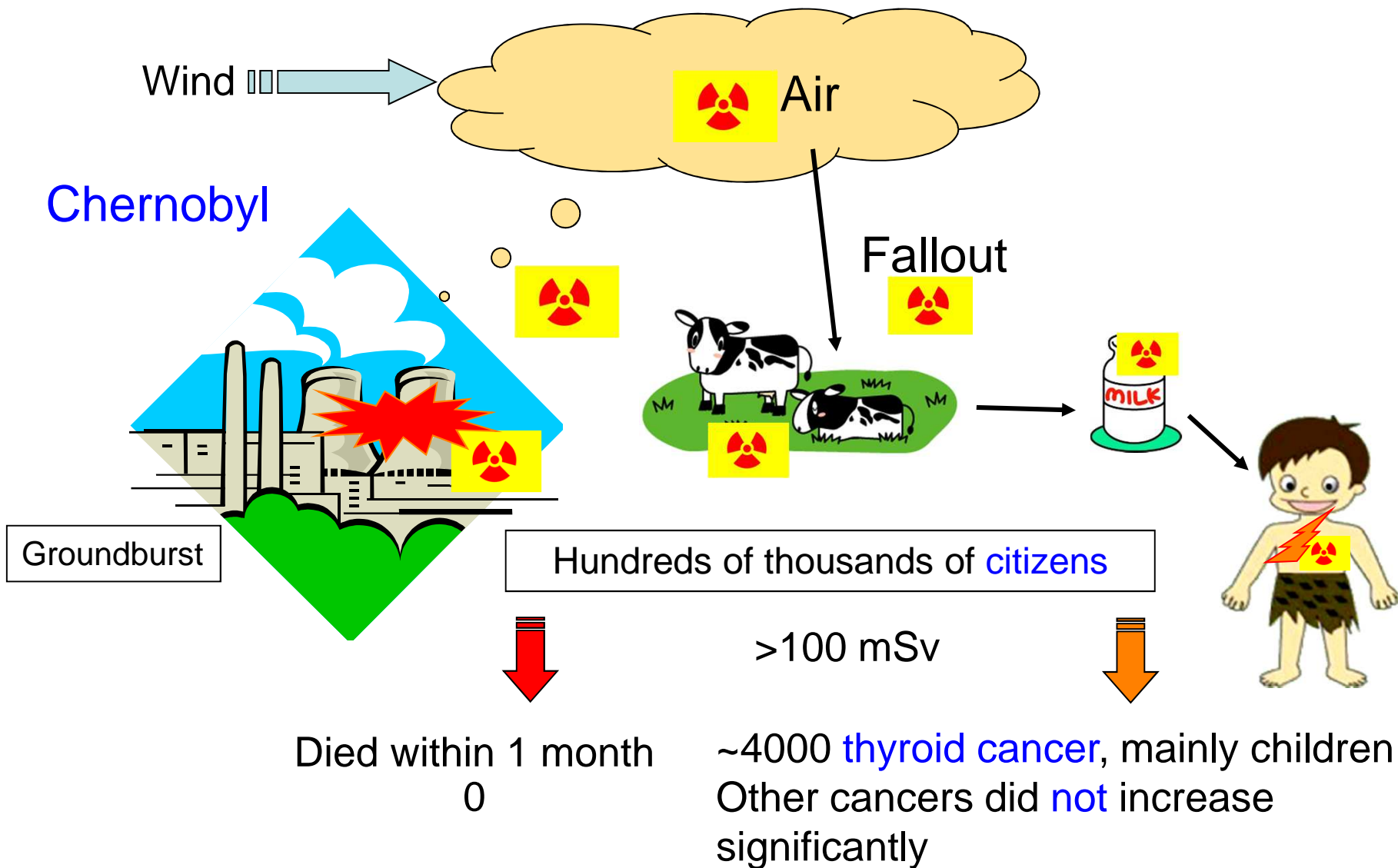
Thousands of **workers and firemen**



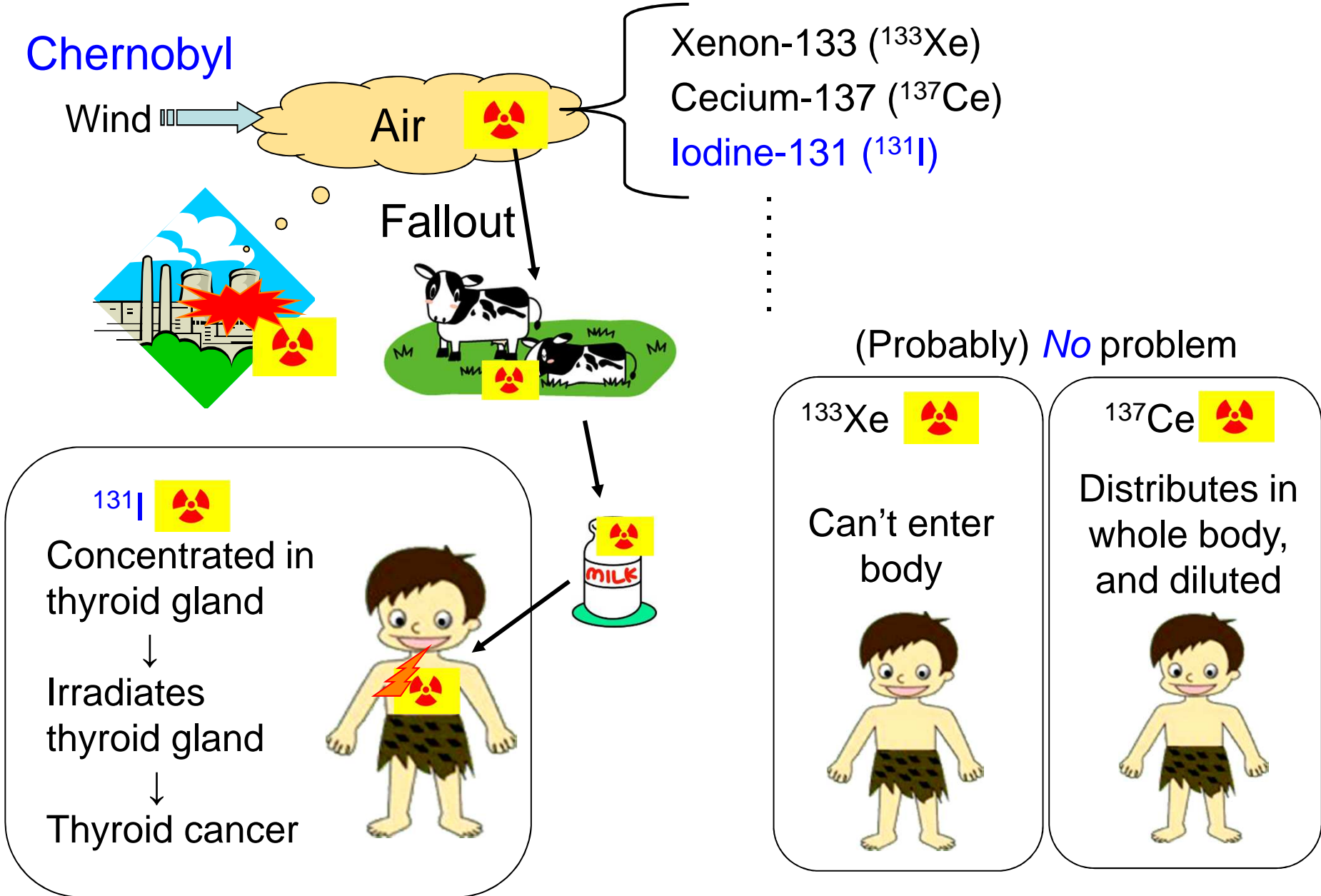
Died ~30
Seriously injured ~200

No significant increase
of **cancer**, so far

Internal exposure (Irradiation from inside)



Why thyroid cancer ?

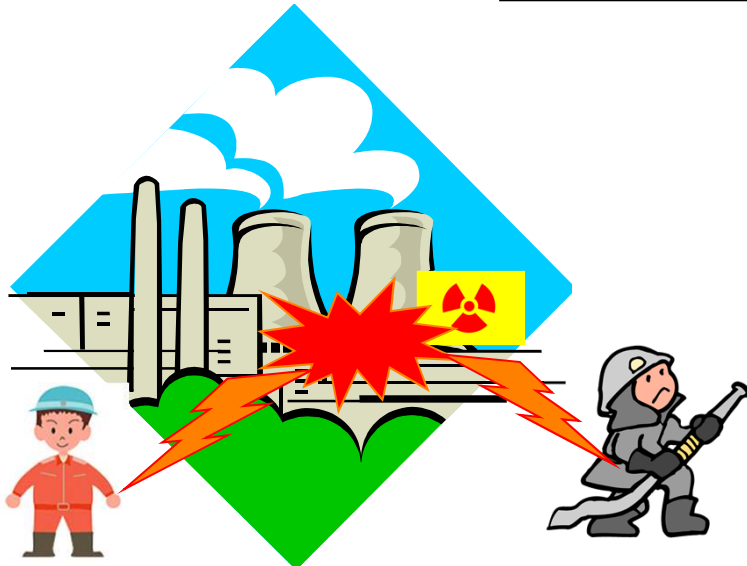


What's going on in Fukushima

Fukushima : External exposure

Chernobyl

Groundburst



Thousands of **workers and firemen**



>100 mSv
(Hundreds >1 Sv)



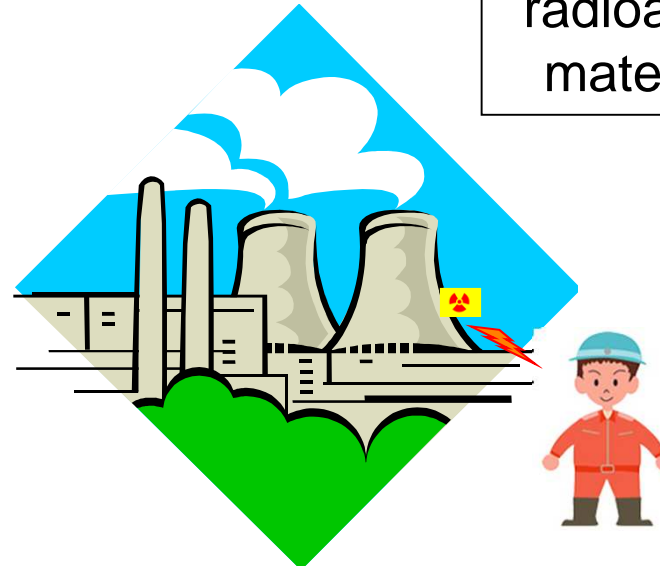
Died ~30

Seriously injured ~200

No significant
increase of **cancer**,
so far

Fukushima

Release of
radioactive
materials



~30 **workers**



100 ~250 mSv



Died 0

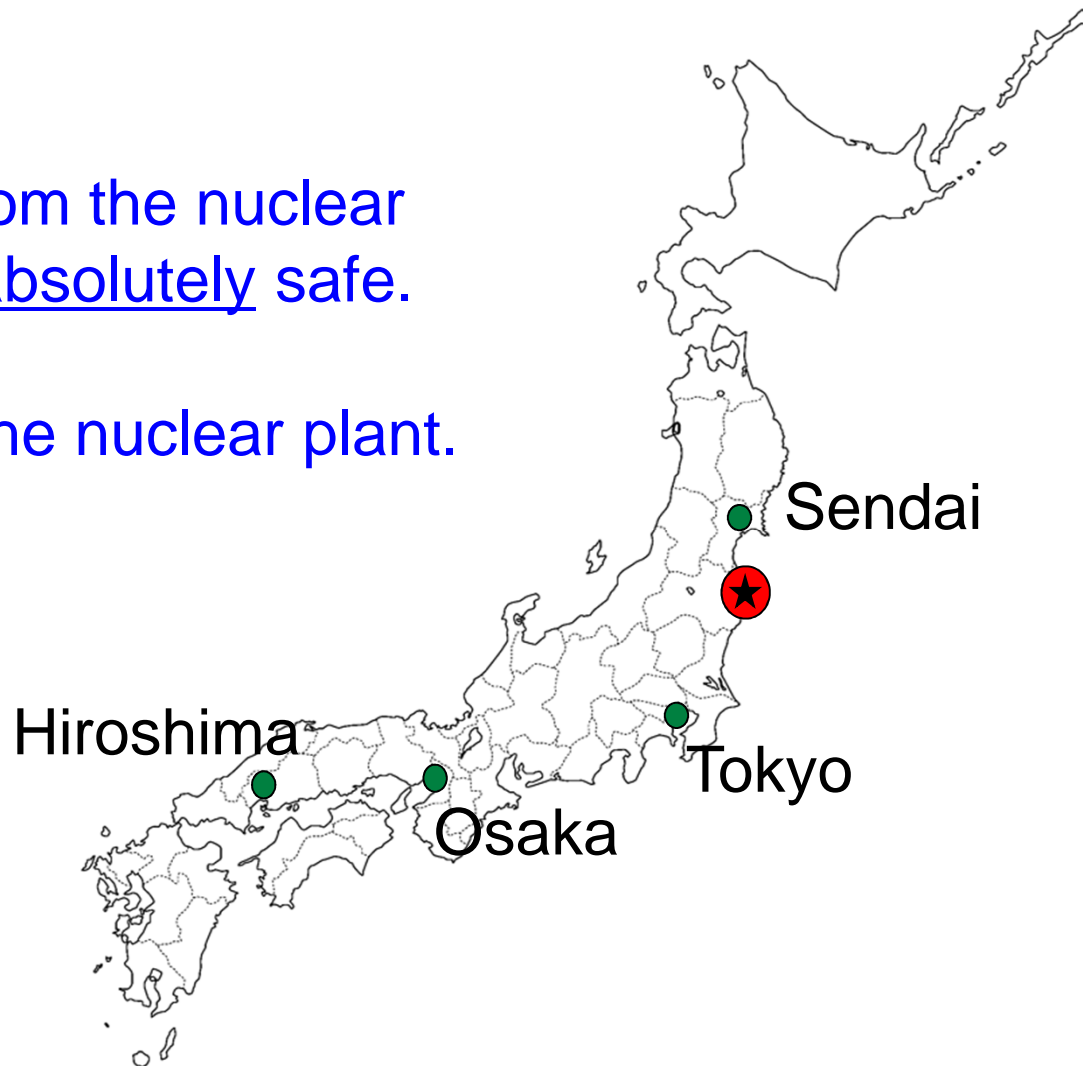
Seriously injured 0

No significant
increase of **cancer**,
most likely

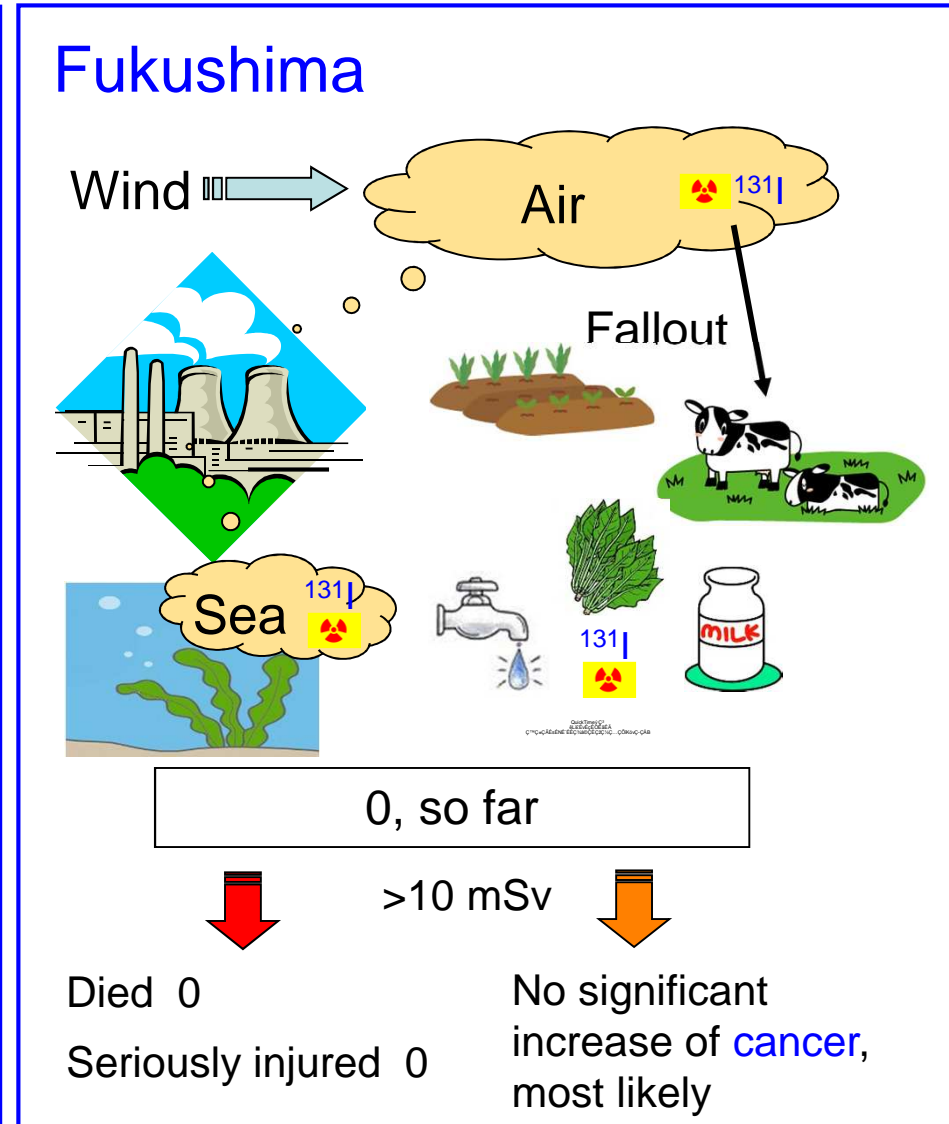
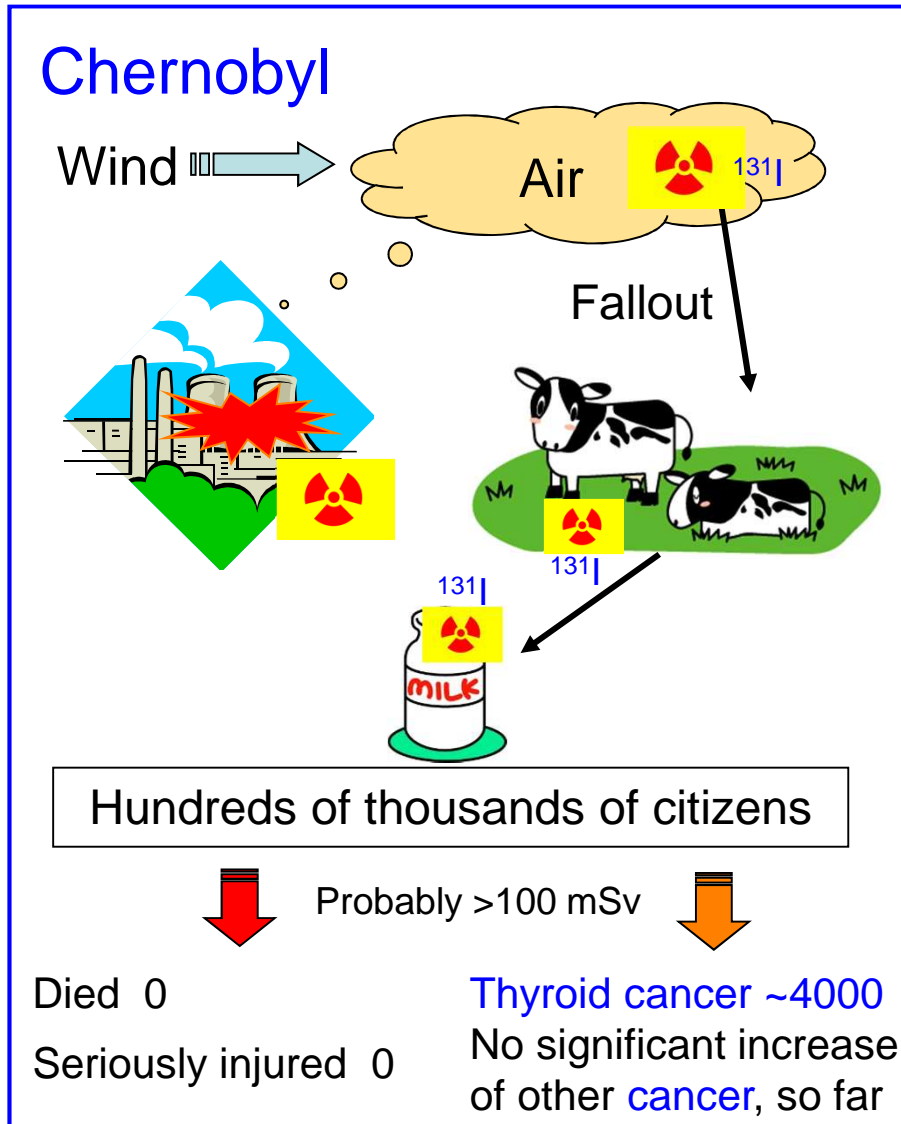
Fukushima : To avoid external exposure what you should do?

Stay 20 km away from the nuclear
plant, and you are absolutely safe.

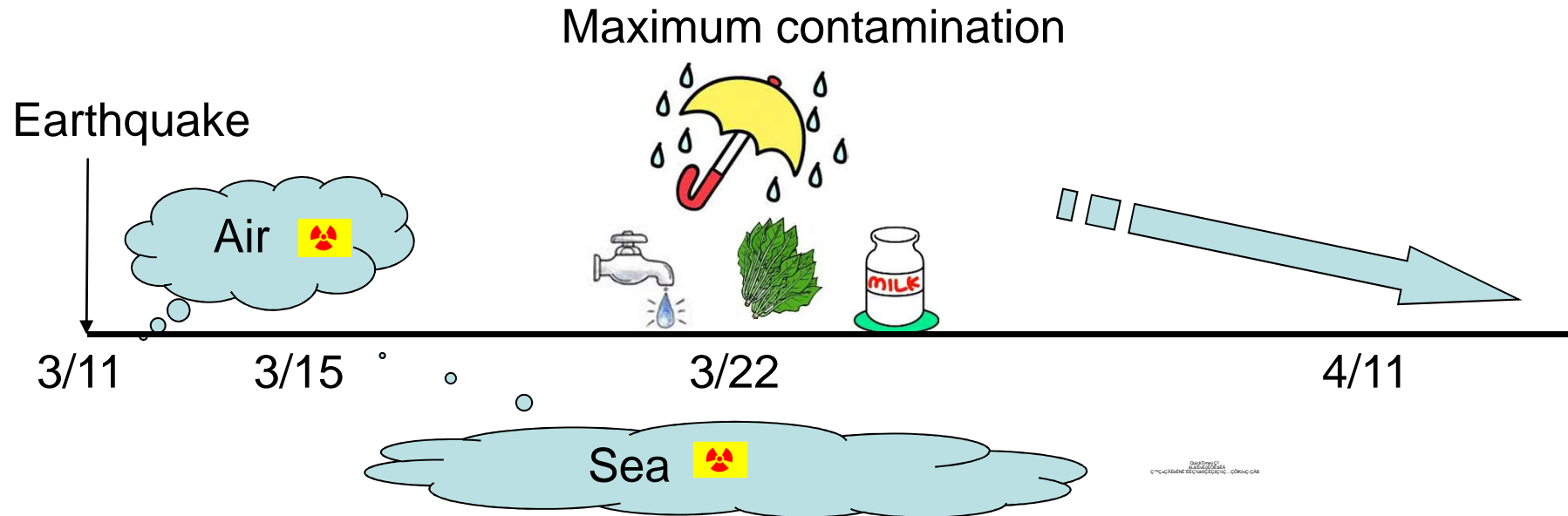
Do not try to enter the nuclear plant.



Fukushima : Internal exposure



Fukushima : Time course of release of radioactive materials



Contamination levels are **very low** even at maximum levels
Contamination levels are improving

If you take in these contaminated water **more than 1Kg for 1 year**,
you may get slightly increased risk for cancer.....

2. Inhalation of contaminated air (by breathing)

Once air in this area was contaminated with radioactive materials **at very low levels.**

Currently radioactivity of air in Tokyo is less than half of that in Moscow



3. Tapwater



Once tapwater in this area was contaminated with radioactive materials **at very low levels.**

At that time, if you drink >10 L of tapwater every day for years, you might get slight increase of cancer risk.



4. Food



Quantity of
Cesium-137
in
C¹³⁷CASINE ELECTROCHEMICAL COMPANY

Vegetable, milk, and fish in this area might contaminated with radioactive materials **at very low levels.**

If you have such food more than 1 Kg every day for years, you might get slight increase of cancer risk.

Contaminated food won't be shipped to market.



Possible question

Q: I have heard that Fukushima is now rated 'Level 7', the same as Chernobyl. If there is a big difference between Fukushima and Chernobyl, why the same level?

A: Many experts in United Nations, USA, France, Russia, and other countries think that this rating system is not good for evaluating big accident. I expect that the rating system will be changed in the future to avoid confusion. I think that if Fukushima is '7', Chernobyl should be '8' or even '9'. Many experts will agree.

Do not worry too much

External exposure : you are absolutely safe as long as you stay 20 Km away from the plant.

Internal exposure : Air, tapwater, vegetable, milk, and fish near the nuclear power plant are once contaminated with radioactive materials **at very low levels**.

Overall, radioactivity is decreasing to normal levels.

If you take in (maximum) contaminated water/food **more than 1 Kg every day for 1 year**, you might get slightly increased cancer risk.

Research Institute for Radiation Biology & Medicine will inform you immediately if the situation worsens.